

Armed Forces College of Medicine

AFCM



Arteries and Veins
Of
Head and Neck

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INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Identify the 2 main arterial systems of head & neck.
2. Discuss origin, course, termination, branches & main relations of subclavian artery.
3. Describe origin, course, termination, branches & main relations of common carotid, external carotid & internal carotid arteries.
4. Describe origin, course, termination, tributaries & main relations of both subclavian & internal jugular veins.
5. Identify the 4 jugular veins of the neck.



Key points



1. Subclavian artery.
2. Carotid arteries.
3. Veins of the neck

Arteries of head & Neck



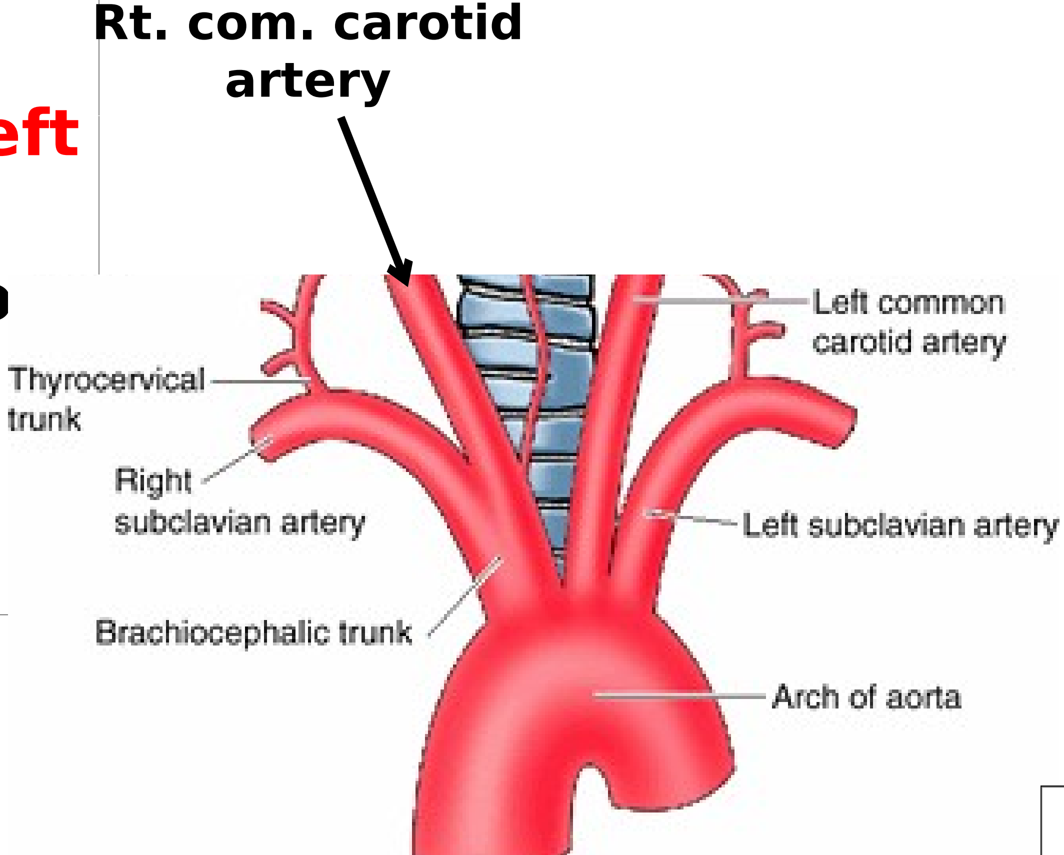
2 systems on each side; subclavian & carotid.

-Origin: Both systems arise within the thorax as follows:

.Directly from arch of aorta on left side.

.From brachiocephalic artery (fro arch of aorta) on right side.

Rt. com. carotid artery





Subclavian artery

-**Origin**: Left subclavian from aortic arch.

Right subclavian from brachiocephalic artery.

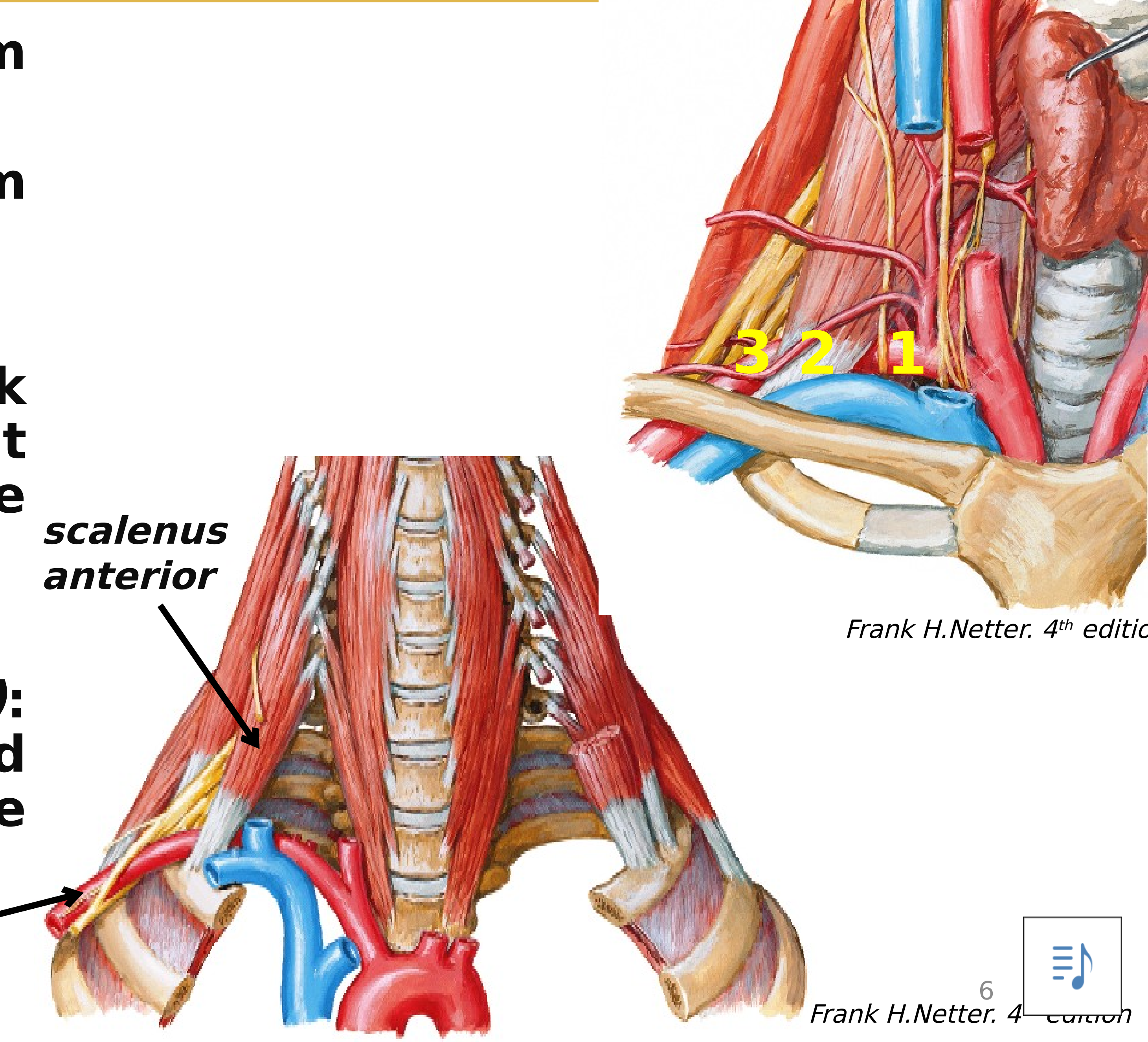
-**Course**:

.It enters the root of the neck behind <u>sternoclavicular</u> joint on each side. It arches above the apex of lung.

-**Parts**:

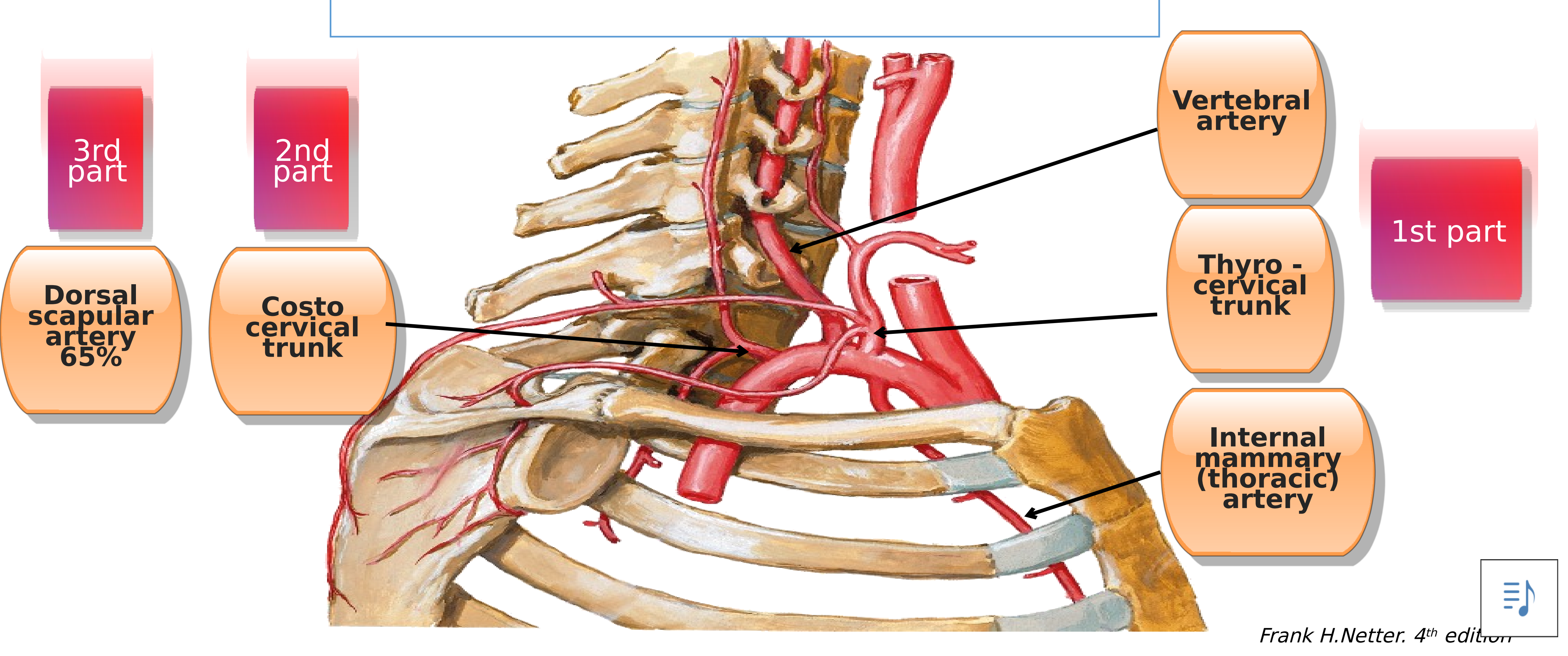
3 parts *(by scalenus anterior)*: 1st part medial, 2nd part behind & 3rd part lateral to the muscle.

-**Termination**:



Subclavian artery

Branches of Subclavian artery



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ertebral artery

Divided into 4 parts:

-**First part**

passes upward to foramen transversum of C6.

-**Second part**

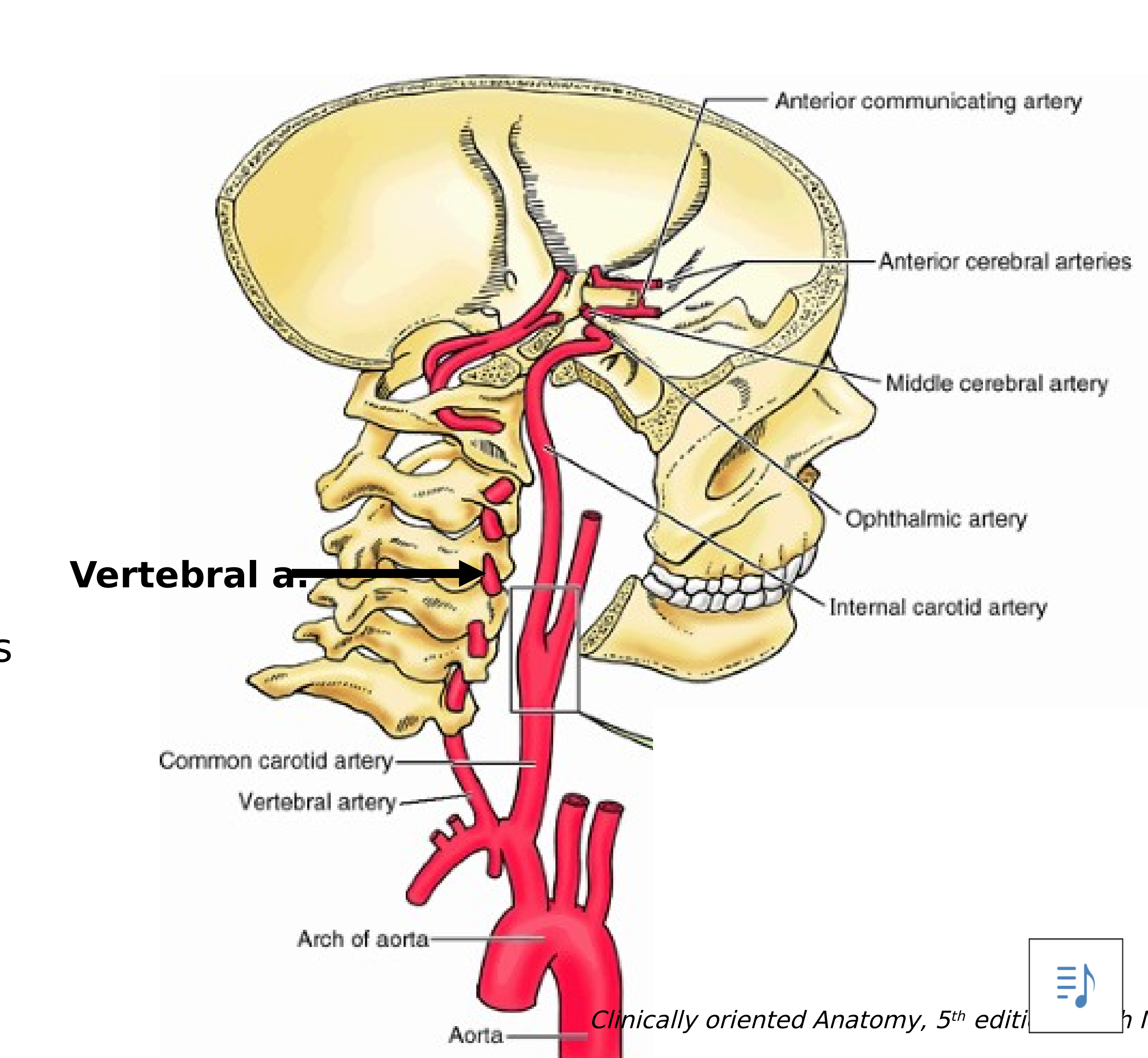
passes upward through formina transversia from C6-C1.

-**Third part**

passes over the posterior arch of atlas in suboccipital ▲.

-**Fourth part**

enter cranial cavity via foramen magnum to pass over anterior surface of medulla, finally united with its opposite to form **basilar artery** on anterior surface of pons



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Quiz 1 (Subclavian artery)



One of the following arteries is a branch of second part of

subclavian artery:

a) Vertebral
b) Internal thoracic
c) Lingual
d) Costocervical
e) Thyrocervical

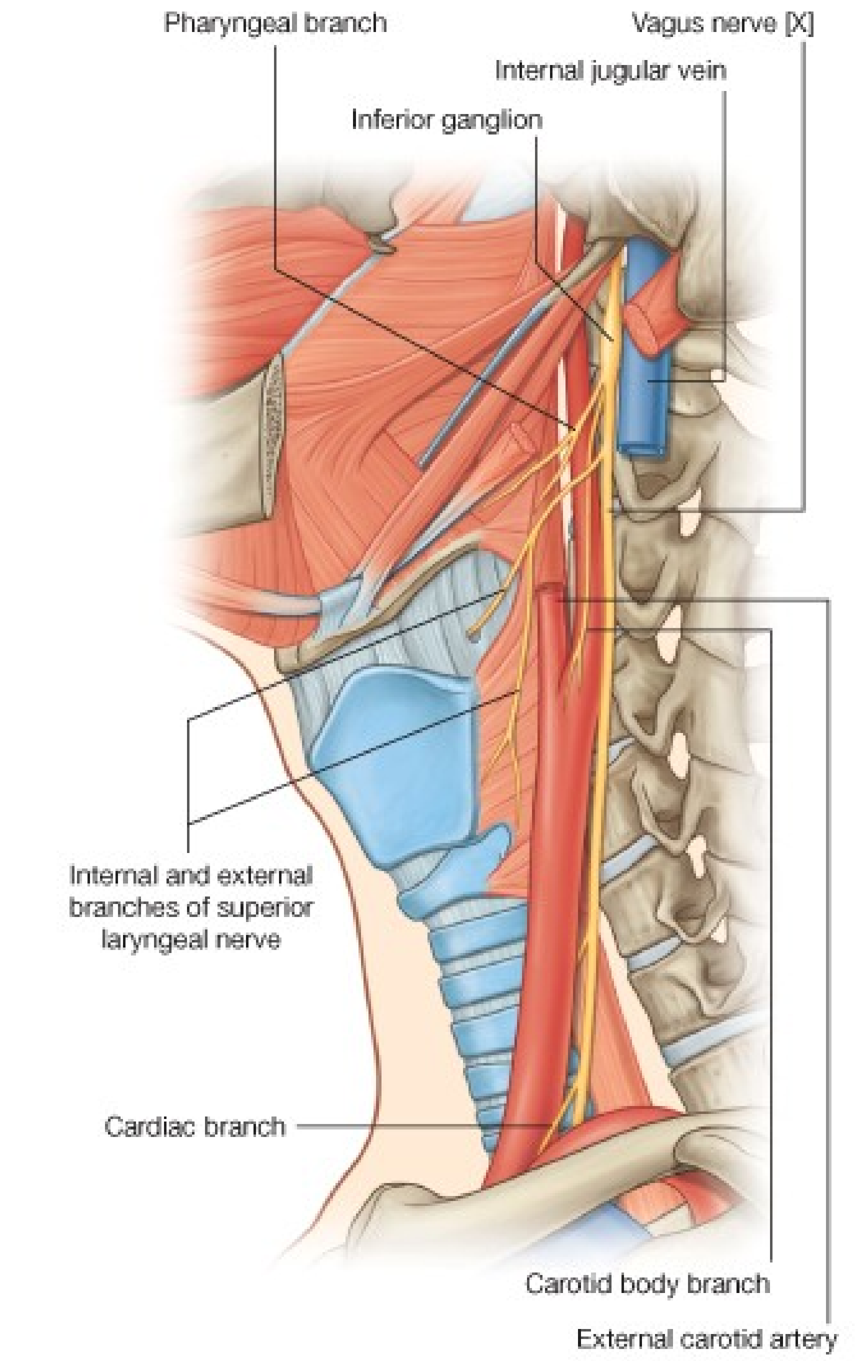


Carotid arteries

.It represents the main arterial supply of head, neck & brain.

.Formed of CCA and its terminals ECA & ICA.

.Both CCA & ICA are enclosed with IJV & vagus nerve in carotid sheath, that extends from root of the neck till the base of skull.



1]Common carotid artery:

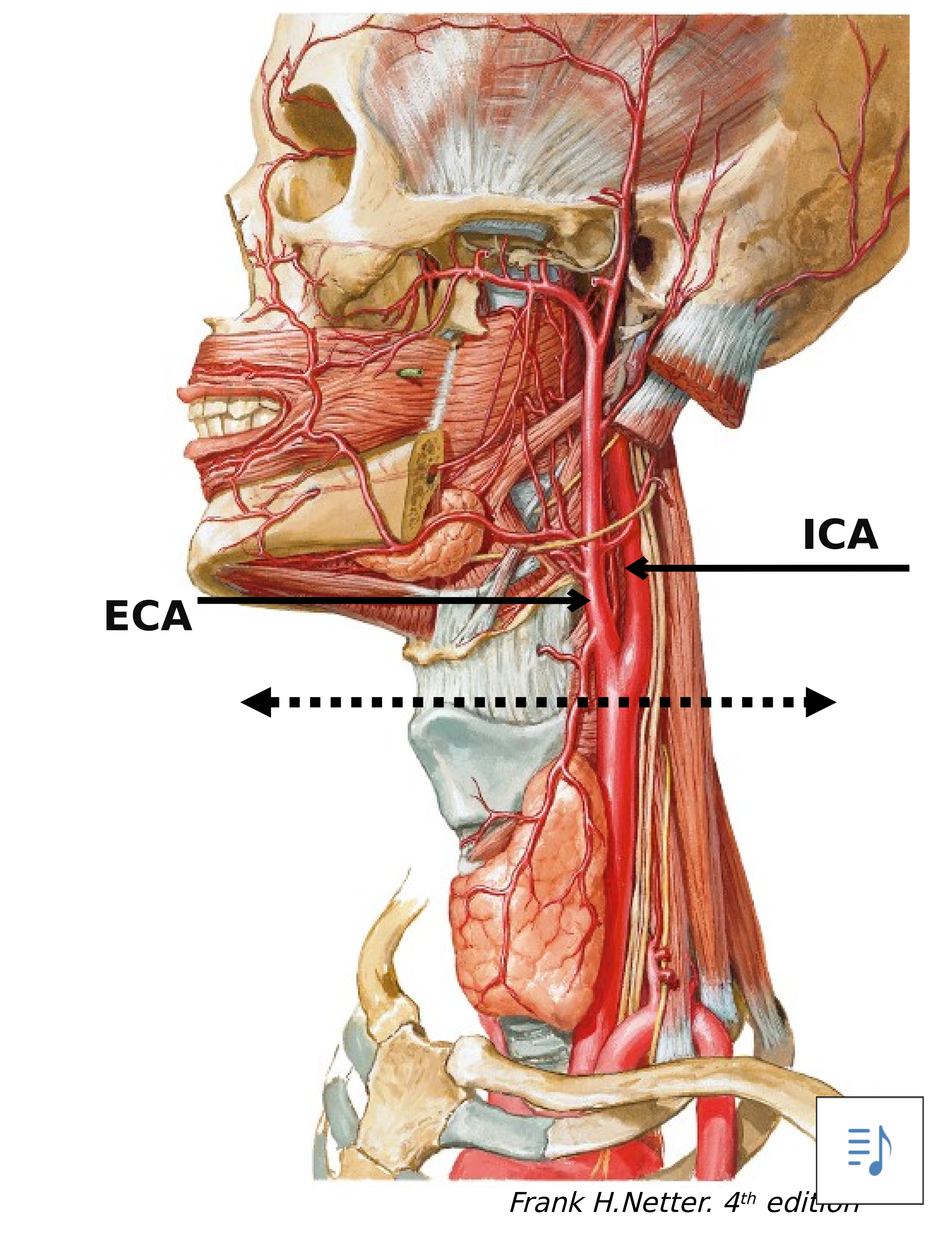
-Origin: .Left CCA from aortic arch.

.Right CCA from brachiocephalic artery.

-Course: .It enters the root of the neck behind sternoclavicular joint on each side. It passes obliquely upwards & slightly laterally in the carotid sheath till the upper border of thyroid cartilage.

-Termination:

Opposite the disc between



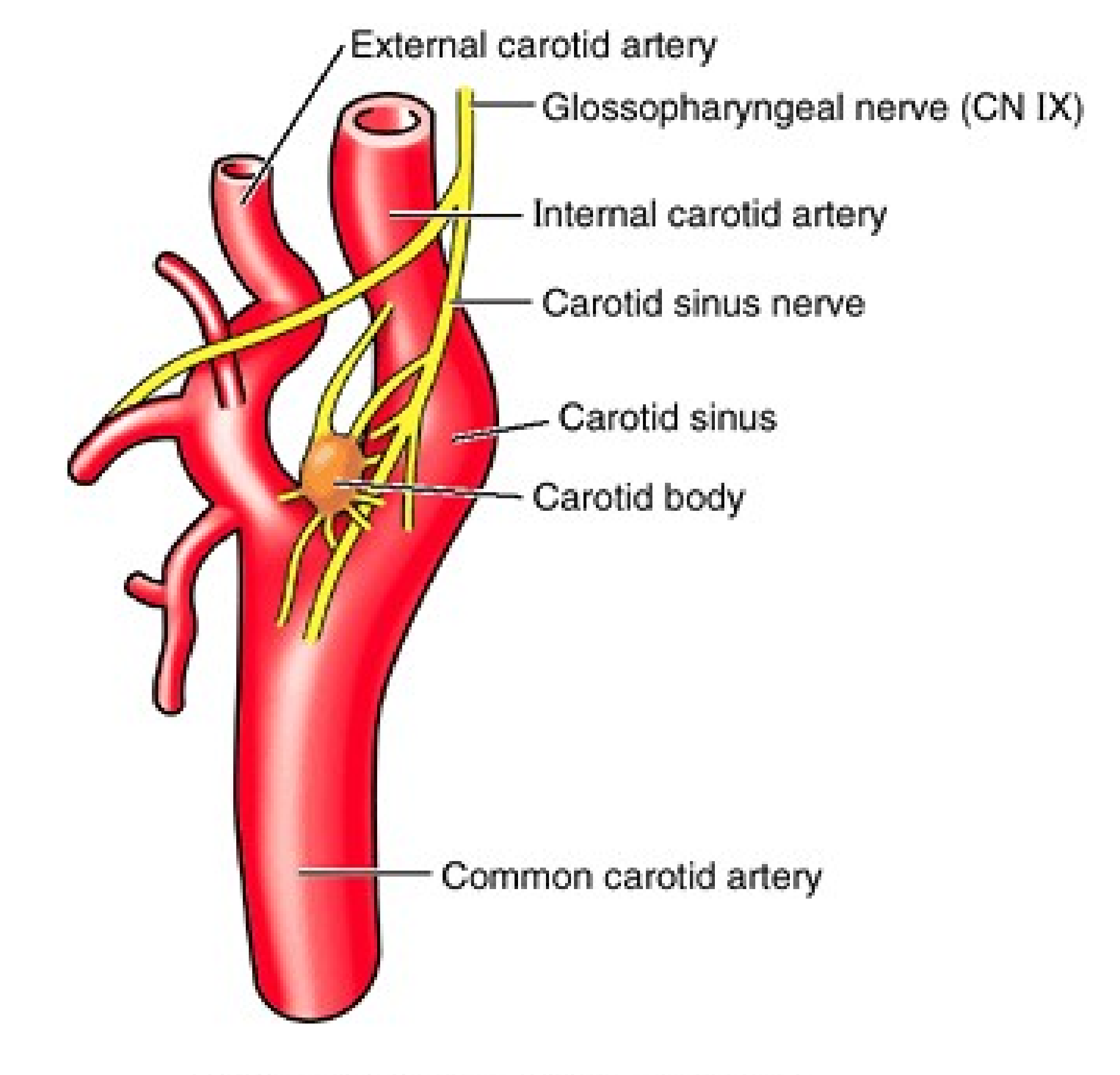
-At the termination of CCA there are 2 special structures:

.Carotid sinus:

A dilatation that contains baro-receptors for controlling arterial blood pressure.

.Carotid body:

A small reddish body that acts as chemo-receptor controlling O2 & Co2 contents of the blood.



Medial view of right carotid artery

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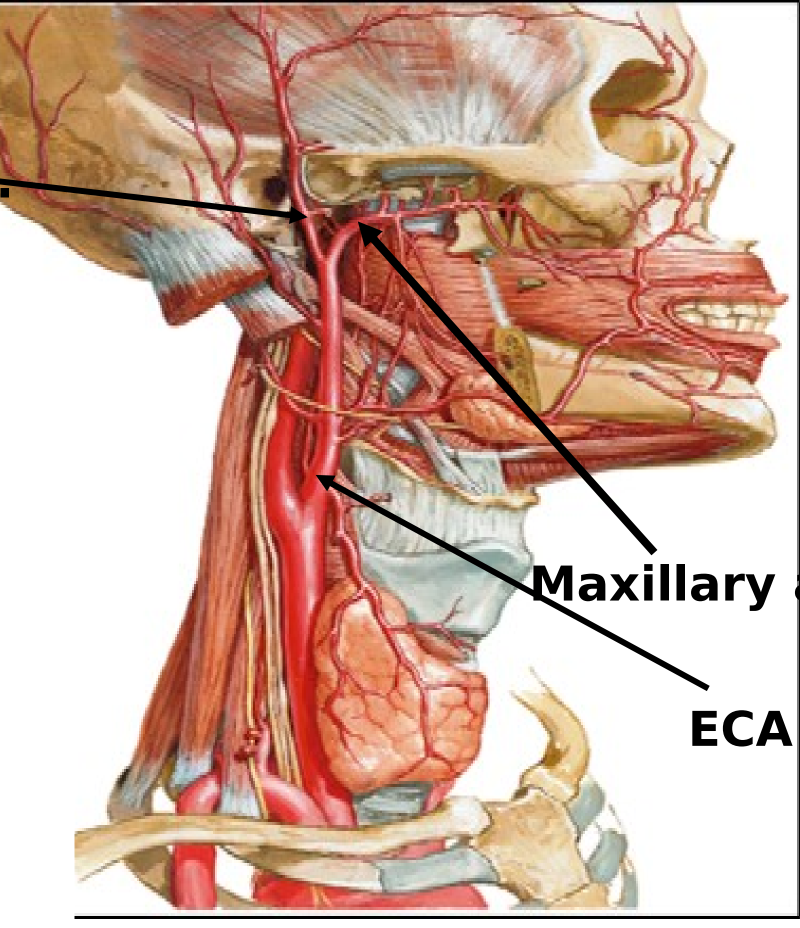


2]External carotid artery:

-**Origin**: One of 2 terminal branches of CCA at upper border of thyroid cartilage opposite the disc between C3 – C4.

-**Course**: .It runs upward & slightly backward outside the parotid gland <u>behind the neck</u> of the mandible by dividing into superficial temporal & maxillary As.

-**Termination**: Within the carotid sheath



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Maxillary artery and vein

Transverse facial artery and vein

Superficial temporal artery and vein

Facial nerve [VII]

Posterior auricular artery

Retromandibular vein

Parotid gland

External carotid artery

External jugular vein

ches



Branches of ECA:

***S**ome **A**merican **L**adies*
***F**ound **O**ur **P**yramids **S**o*
***M**agnificent*

8 branches, arranged as follows:

:anterior branches 3.

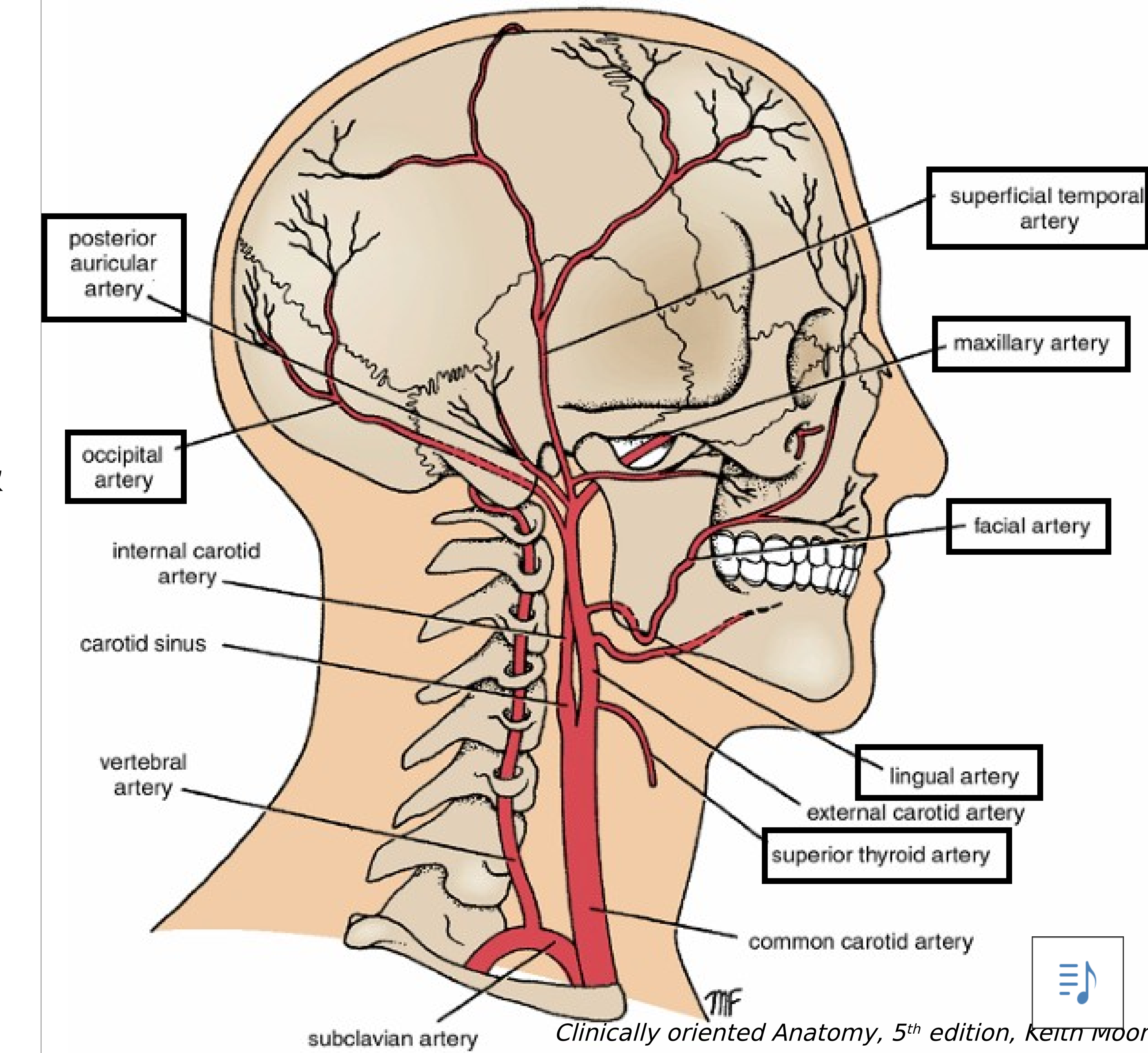
Superior thyroid, lingual, & facial.

.2 posterior branches:

Posterior auricular & occipital.

.1 medial branch:

Ascending pharyngeal.



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3]**Internal carotid artery**:

.**Origin**: As ECA.

.**Course**: Is divided into 4 parts:

-1st part is the cervical part

(Within carotid sheath).

- **2nd part (Petrous part)**

passes through carotid canal of skull.

-3rd part (Cavernous part)

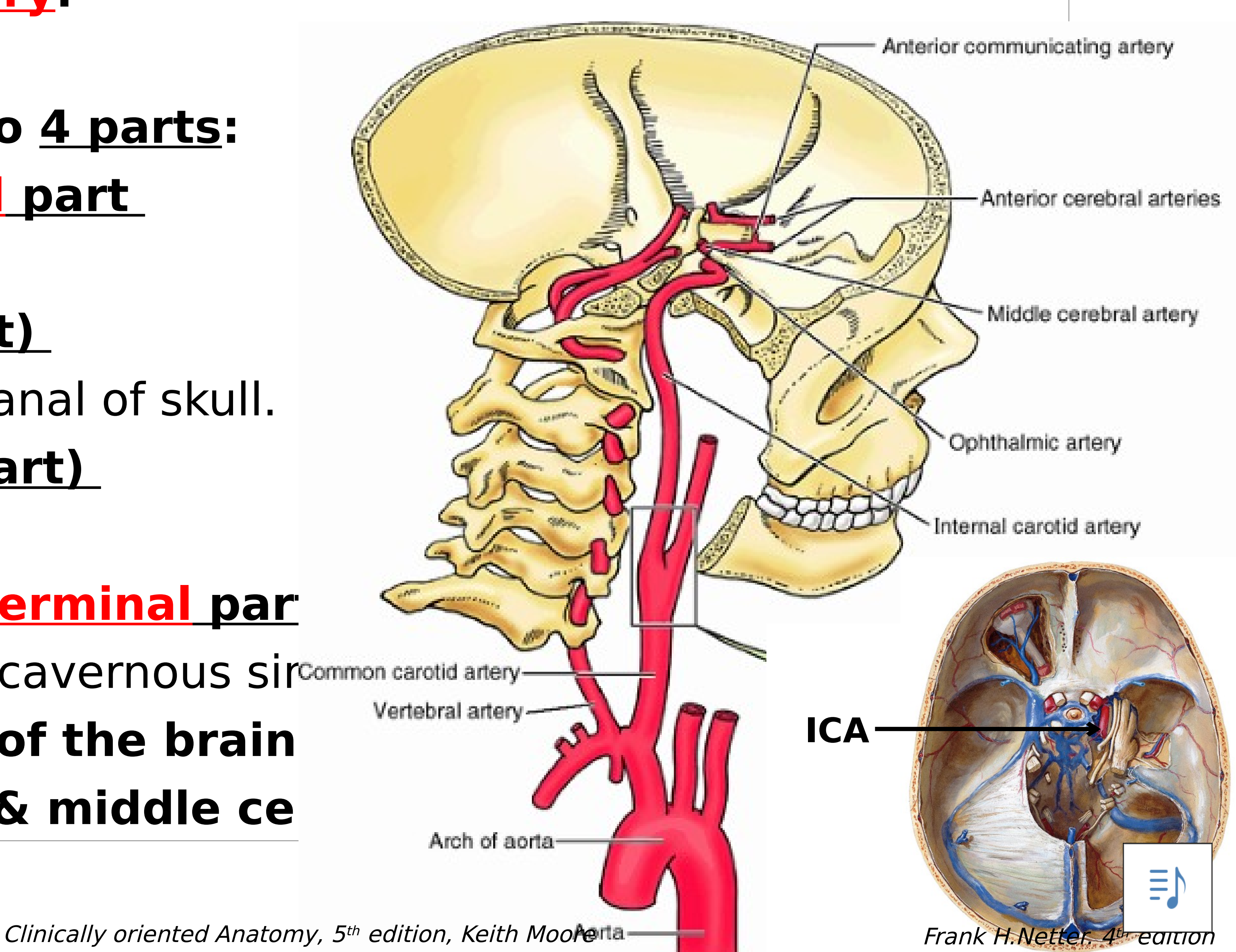
runs in cavernous sinus

-4th part (Cerebral or terminal par

emerges through roof of cavernous sir

.**Termination**: At base of the brain

dividing into anterior & middle ce



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Note that

- CCA has only 2 branches ECA & ICA.

.ECA has only cervical course in the neck where it gives its branches.

.ICA has 4 parts; cervical without branches, then petrous, cavernous & cerebral parts with branches.

.ECA lies in front of ICA & is concerned with the blood supply of exterior of the head, face & most of the neck.

.ICA is concerned with the blood supply of ipsilateral cerebral hemisphere, eye & forehead (NO branches in the neck)

Quiz 2 (Carotid arteries)



At which of the following levels common carotid artery

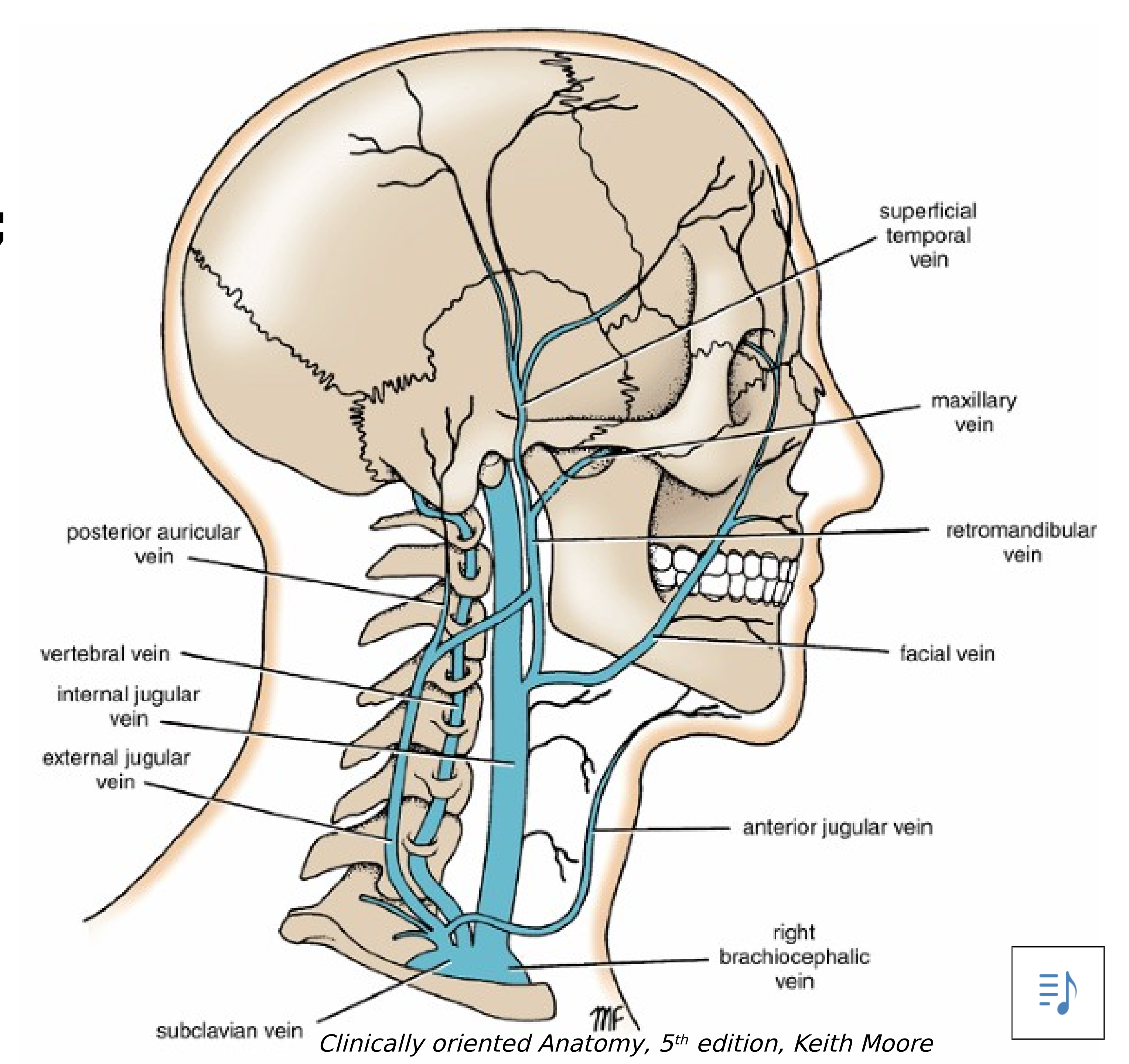
ends?

a) C1-C2
b) C2-C3
c) C3-C4
d) C4-C5
e) C5-C6



Veins of the neck

2 systems on each side; subclavian & jugular.



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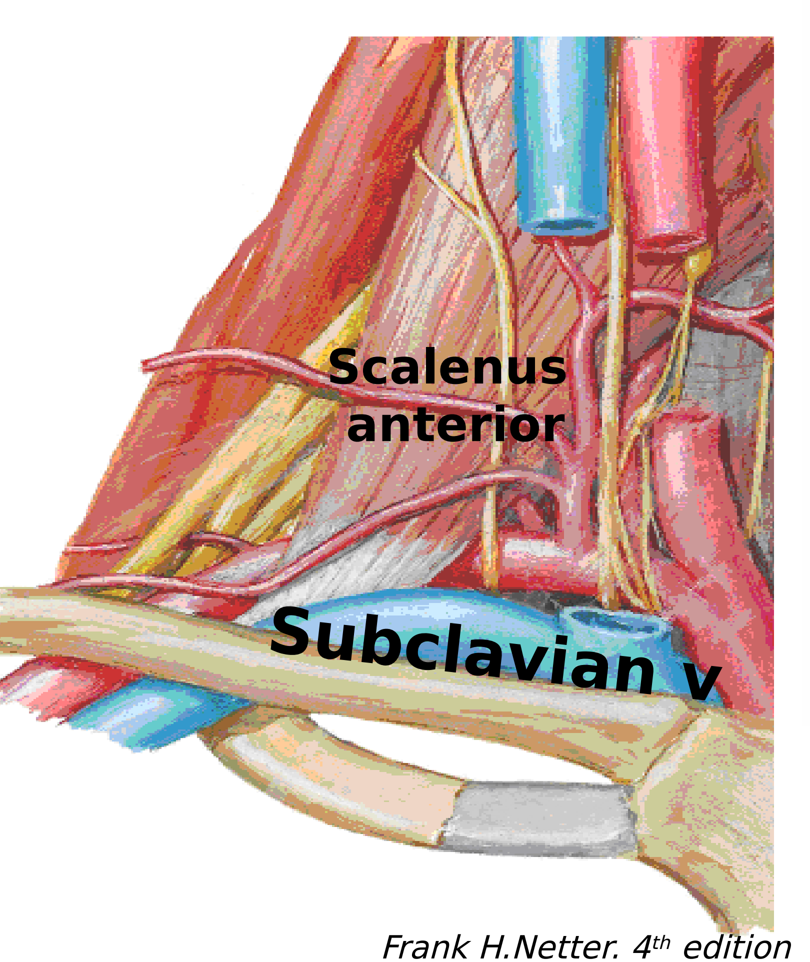
Subclavian vein:

.Origin: At outer border of 1st rib as a continuation of axillary V.

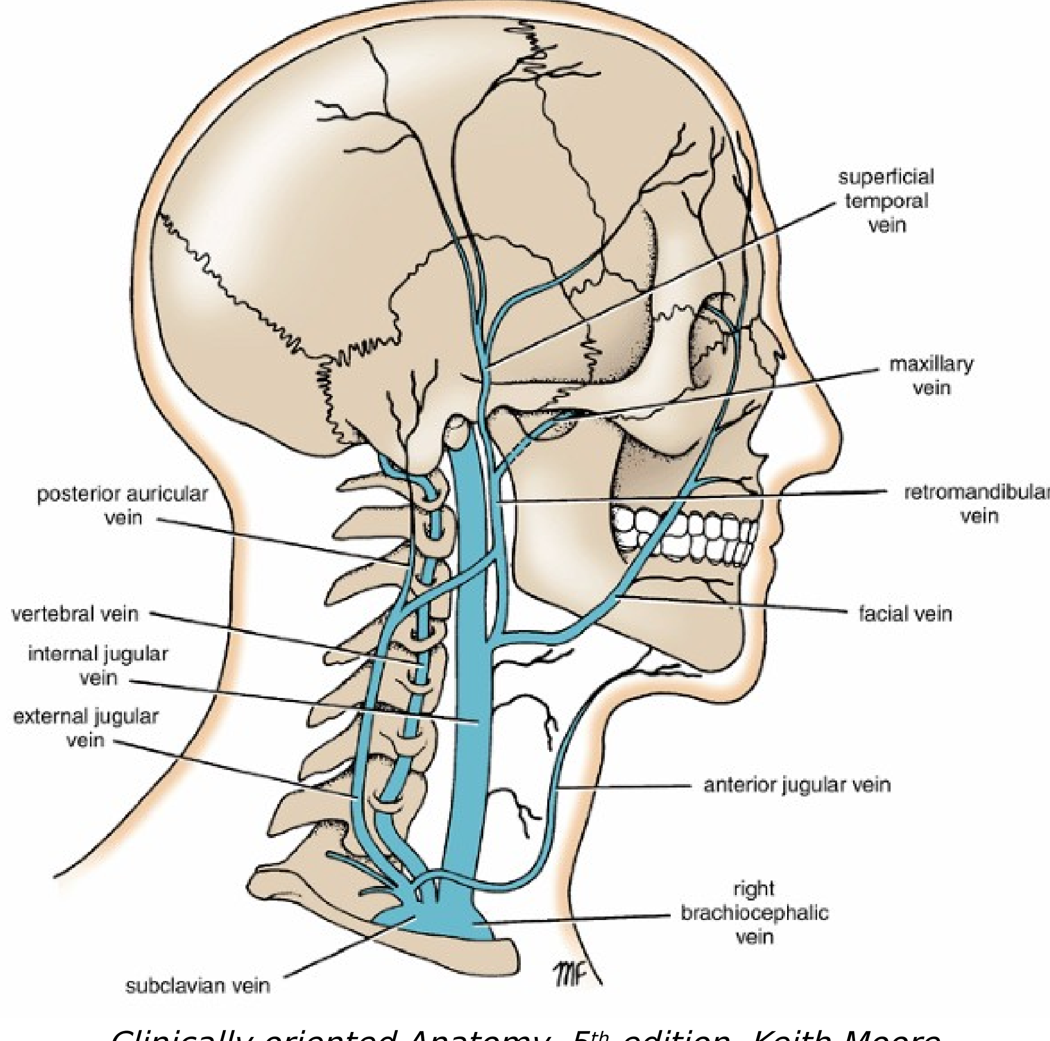
.Termination: At medial border of scalenus anterior (medial end of the clavicle) where it joins IJV to form brachiocephalic V.

.Relations:

It is separated from the artery by scalenus anterior.

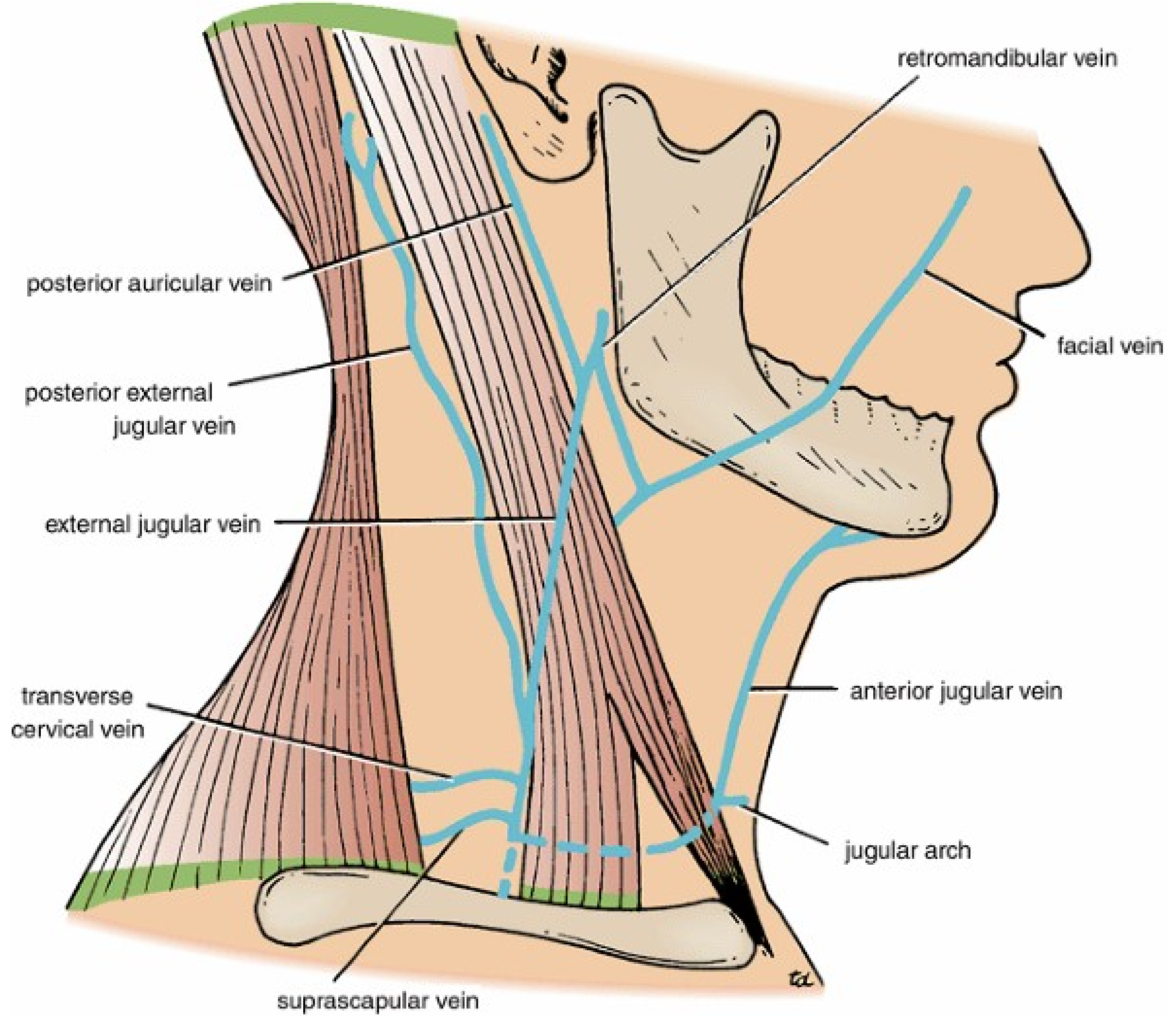


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.There are **4** jugular veins on each side of

the neck →

3 superficial

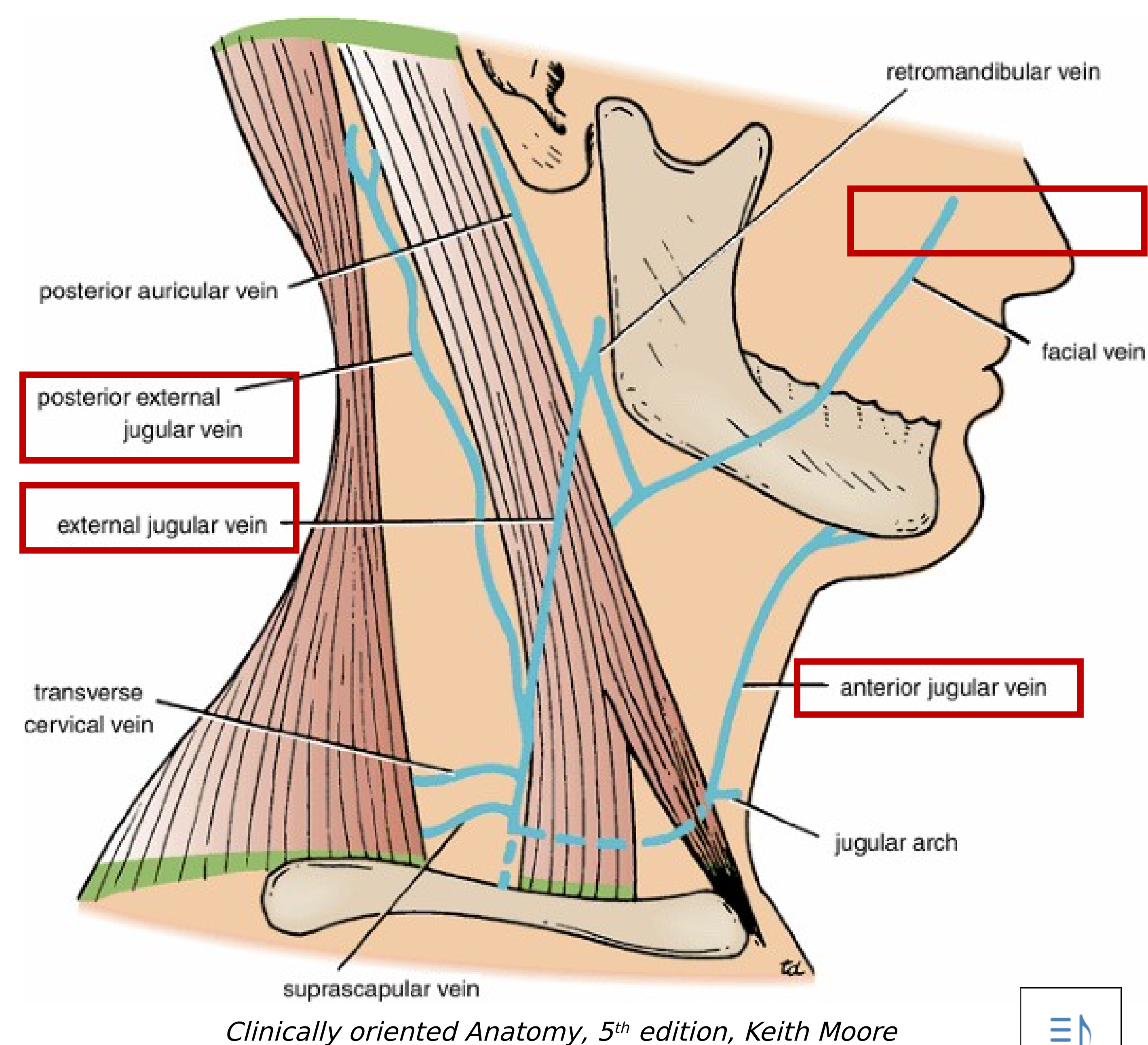
xternal jugular vein (EJV)

Anterior jugular vein

Posterior external jugular vein

& one deep

(the internal jugular vein).



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1.External jugular vein (EJV):

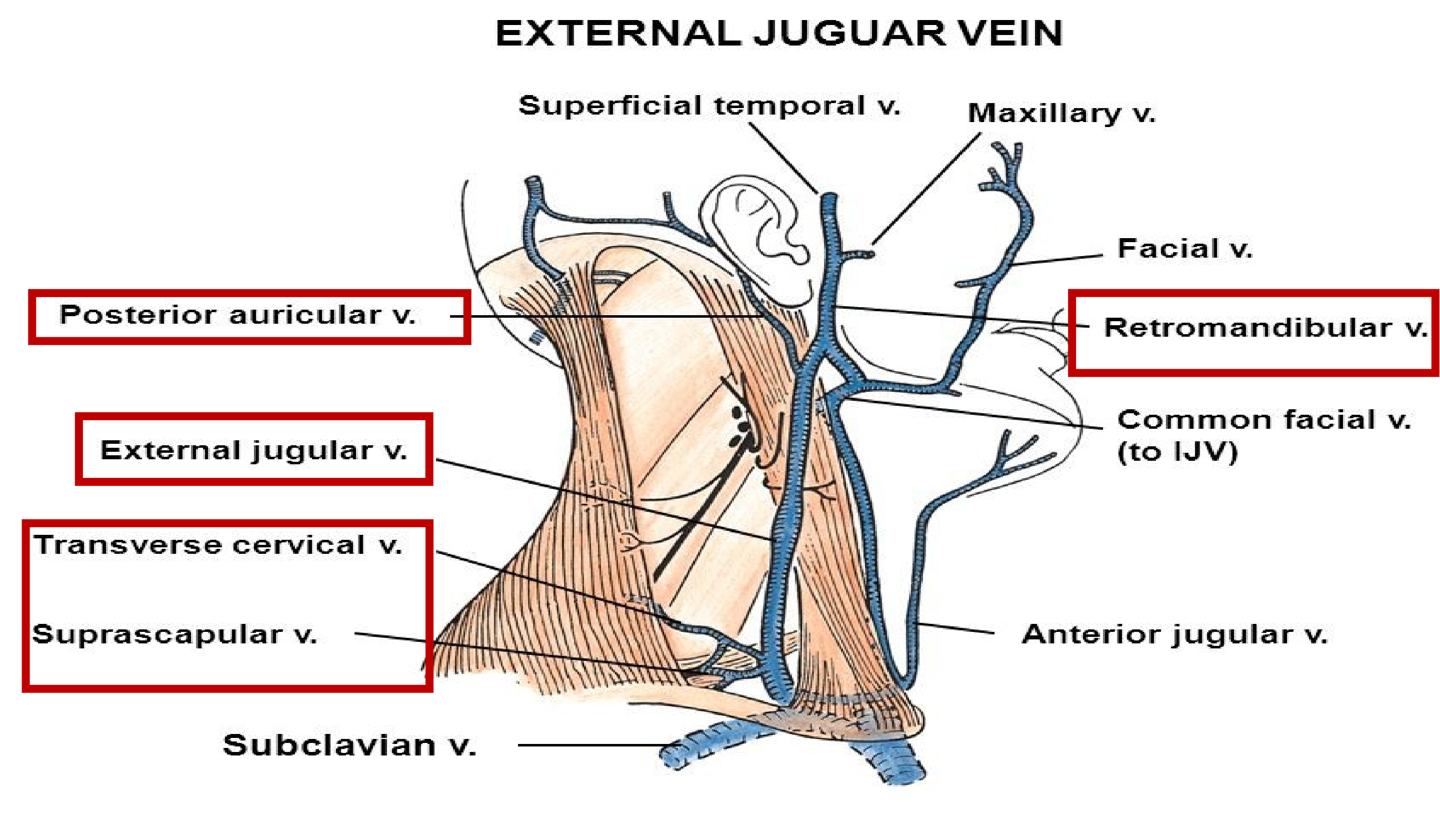
.Formed by union of posterior auricular vein & posterior division of retromandibular vein. *At angle of the mandible*

-It descends superficial to sternomastoid & pierces the deep fascia in the lower part of posterior triangle to drain into the subclavian vein.

.Tributaries:

1- anterior jugular vein

2- posterior external jugular



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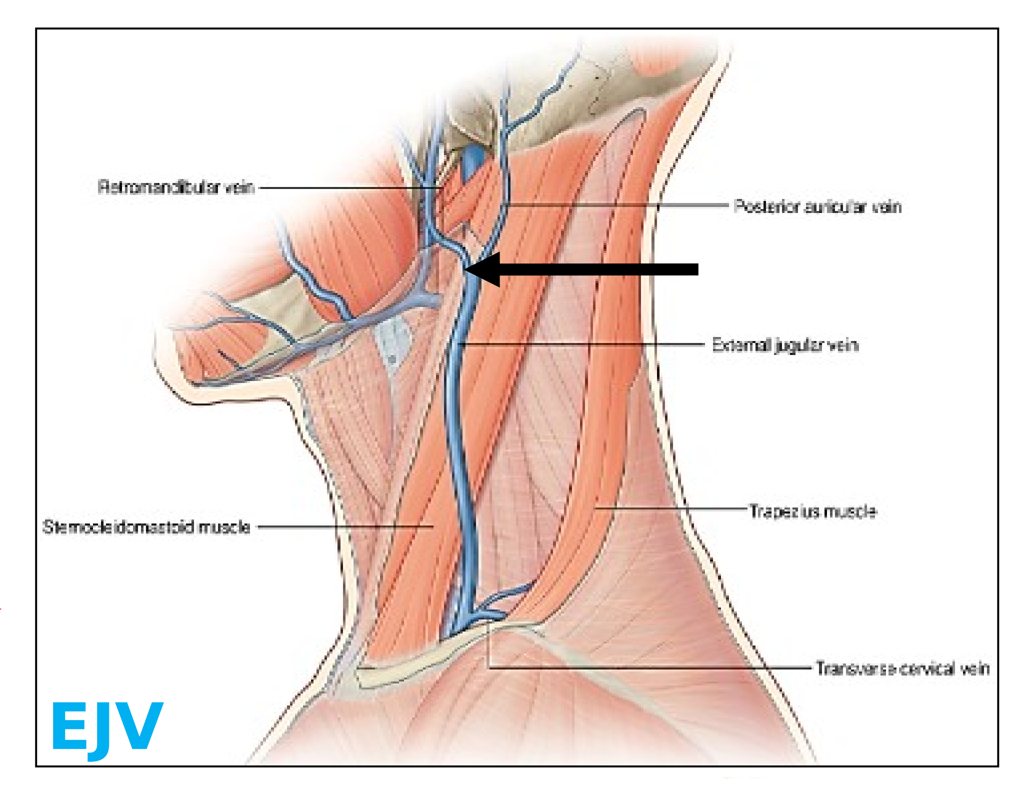
retromandibular vein
posterior auricular vein
facial vein
posterior external jugular vein
external jugular vein
anterior jugular vein
transverse cervical vein
jugular arch
suprascapular vein

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.EJV serves as venous manometer. It is either invisible or observable for only a short distance superior to the clavicle if the venous pressure is within the normal range.

-However, if this pressure rises (as in heart failure, or in singers) the vein becomes prominent throughout its course along the side of neck.



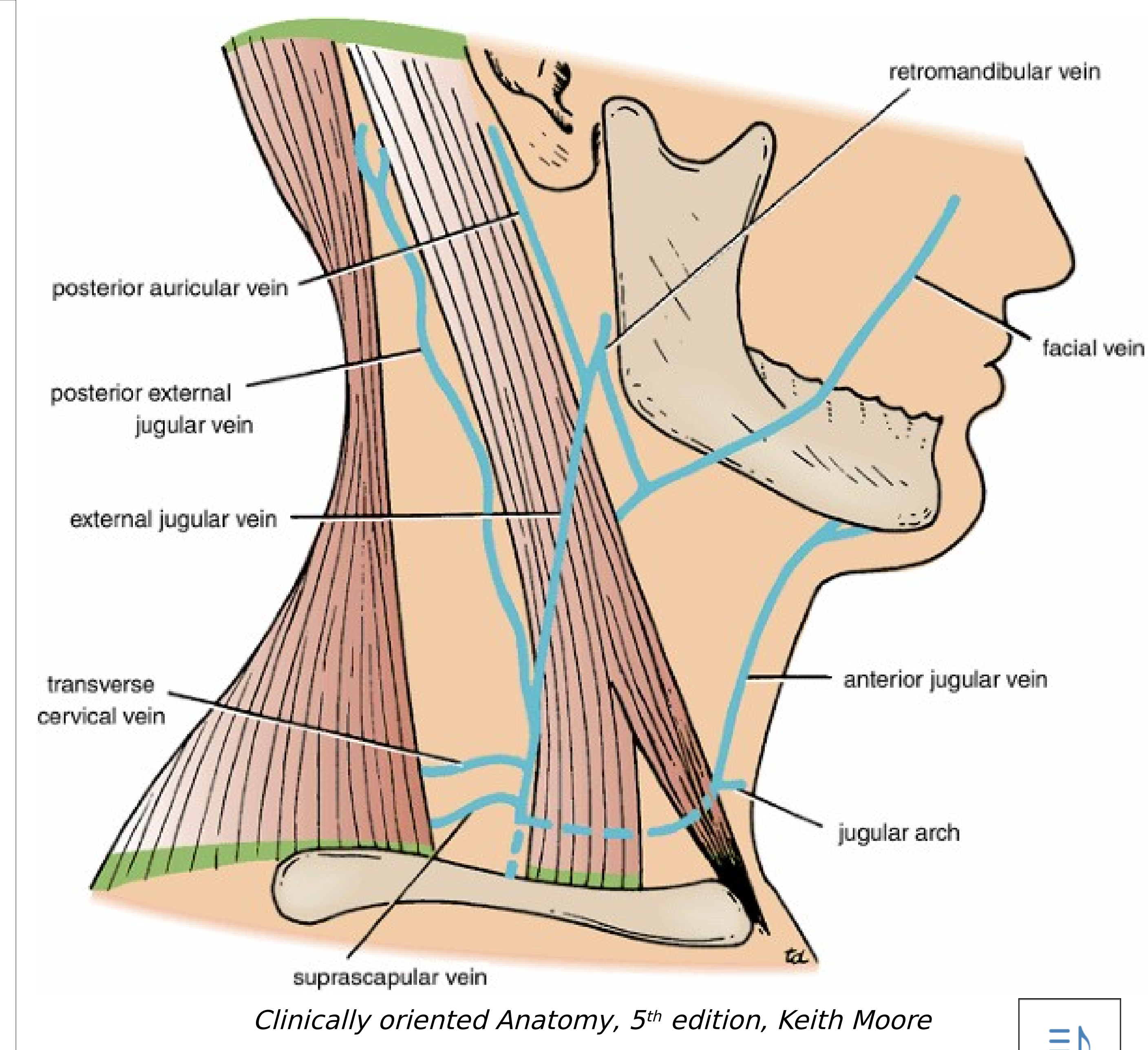


2.Anterior jugular vein:

.Begins in submental triangle & descends close to midline of neck.

-Rt. and lt. anterior jugular veins communicate by jugular arch at suprasternal notch.

-Ends by passing deep to the sternomastoid and draining into EJV.



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3.Posterior external jugular vein: It drains the occipital region & upper part of the back of the neck &

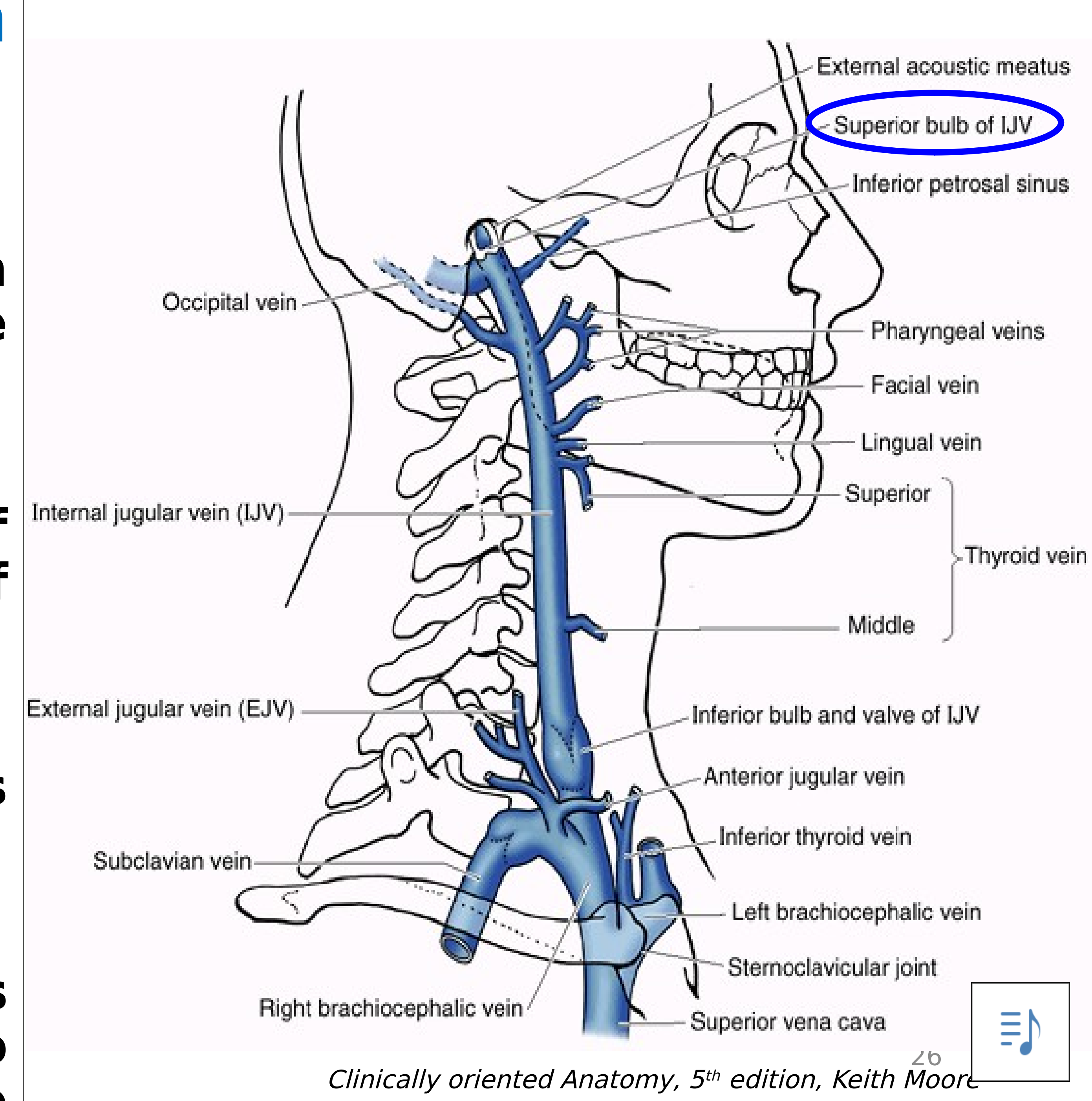
Internal jugular vein (IJV):

.The largest & longest vein in the neck, drains veins of the brain, neck & face.

.Origin: A direct continuation of sigmoid sinus at the base of skull (at jugular foramen).

-It has a dilatation at its beginning called superior bulb.

.Course & relations: It passes downward & forward deep to sternomastoid & within the



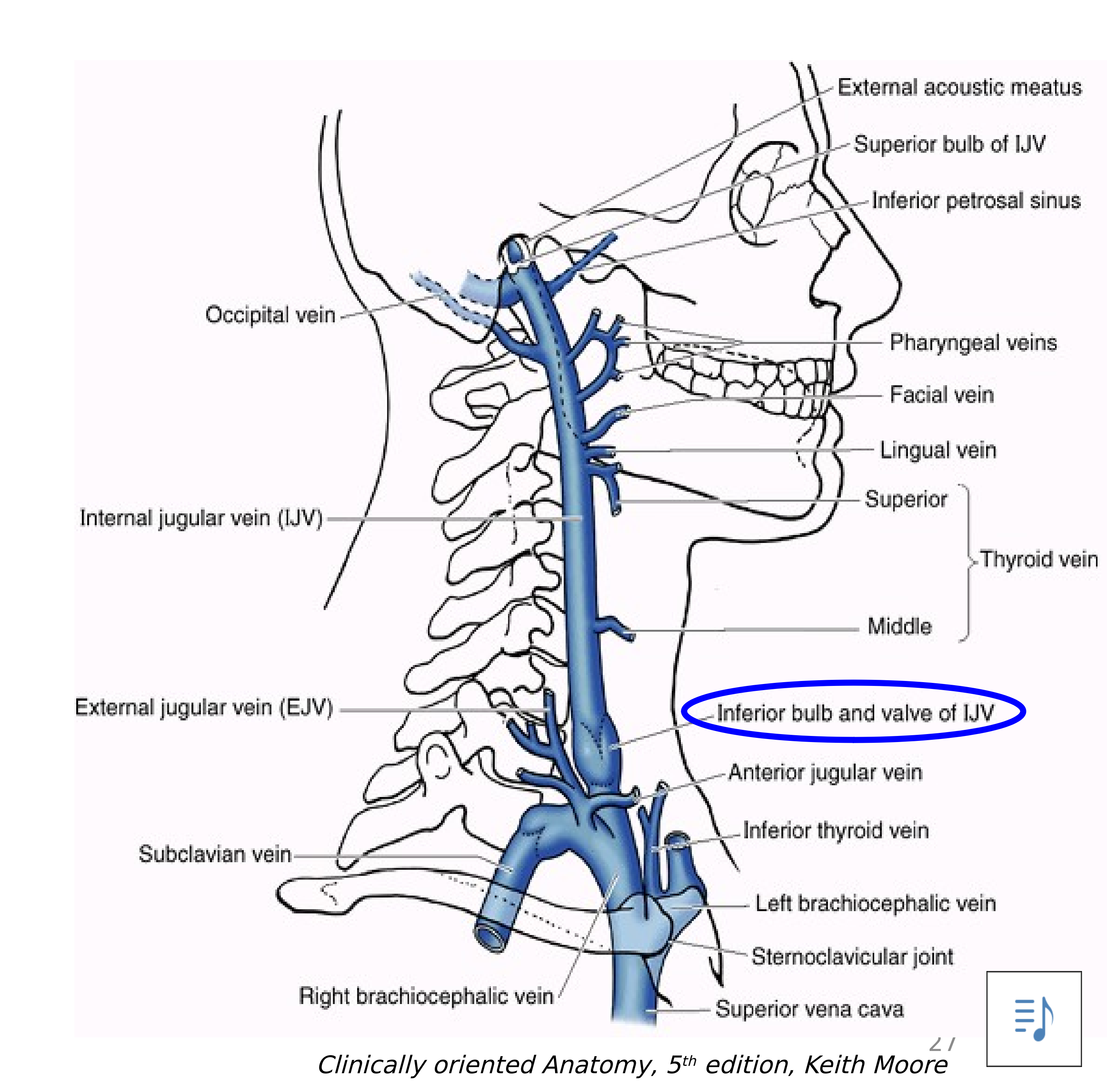
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Internal jugular vein (IJV):

.**Termination**:

IJV joins subclavian V. at sternoclavicular joint to form brachiocephalic V.

-N.B.: At its termination there is another dilatation <u>inferior bulb</u>, above it the vein has 2 valves.



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.Tributaries of IJV: From above downward:

1.Inferior petrosal sinus.

2.Pharyngeal plexus & vein.

3.Common facial V.

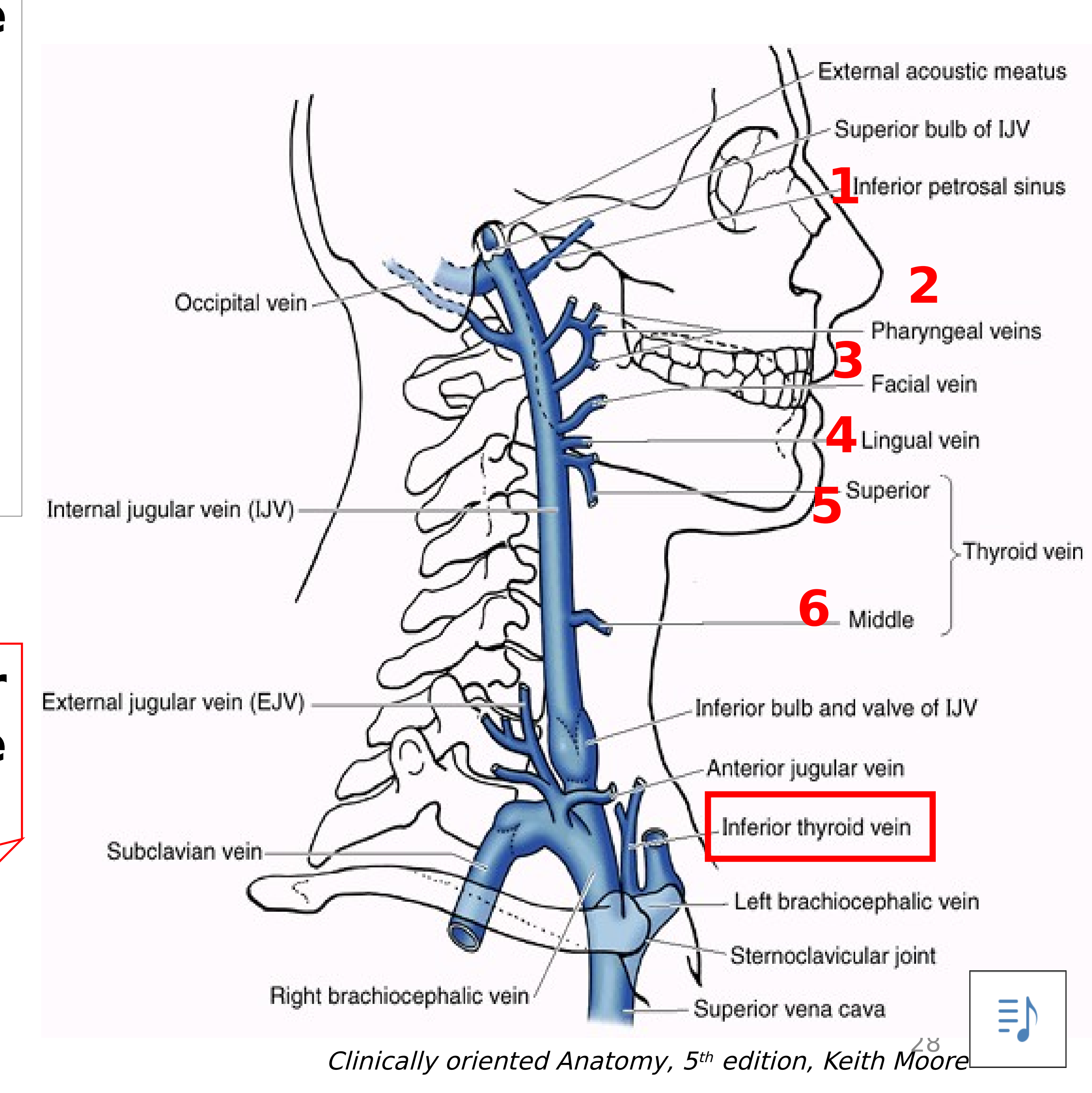
4.Lingual V.

5.Superior thyroid V.

6.Middle thyroid V.

Note that

Vertebral vein & inferior thyroid veins end in the brachio-cephalic vein.



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Quiz 3 (Veins of the neck)



All the following are tributaries of internal jugular vein

except:

a) Common facial
b) Lingual
c) Superior thyroid
d) Middle thyroid
e) Inferior thyroid



Summary



1. Origin, course, termination, branches & main relations of subclavian artery.
2. Origin, course, termination, branches & main relations of common carotid, external carotid & internal carotid arteries.
3. Origin, course, termination, tributaries & main relations of both subclavian & internal jugular veins.
4. 4 jugular veins of the neck.

SUGGESTED TEXTBOOKS



1. Clinical Anatomy by regions, Richard Snell, 9th. Edition pages 596- 601.
2. Atlas of human anatomy, Frank Netter, 4th. Edition plates 30- 34

GOOD LUCK